

1. An assembly for use in a fueling system in which fuel from a storage tank is pumped through a hose to a nozzle for discharge into a fuel tank of a vehicle, the fueling system including a vapor recovery system to process fuel vapors displaced from the fuel tank during fueling, the assembly comprising:

a primary vapor passage adapted to be in fluid communication with the vapor recovery system;

a valve assembly moveable between first and second positions, the first position permitting the uninterrupted flow of vapors through the primary vapor passage and the second position inhibiting the flow of vapors through the primary vapor passage, the valve assembly being biased toward the first position;

a diaphragm mounted within a chamber and coupled to the valve assembly;

a secondary vapor passage in fluid communication with the chamber and the primary vapor passage;

an air bleed passage in fluid communication at a first end with the primary vapor passage upstream from the valve assembly;

a stop coupled to the valve assembly and moveable between open and closed positions, the stop in the closed position sealing a second end of the air bleed passage when the valve assembly is in the first position, the stop in the open position opening the second end to ambient atmosphere when the valve assembly is in the second position;

25 wherein when the air pressure in the chamber is reduced to a predetermined level the diaphragm and the valve assembly coupled thereto move from the first position to the second position and thereby inhibit flow in the valve assembly through the primary vapor passage and vent the primary vapor passage through the air bleed passage when the stop moves to the open position.

2. The assembly of claim 1 further comprising:

a housing holding the valve assembly and the diaphragm and defining at least in part the chamber.

3. The assembly of claim 1 wherein the valve assembly further comprises:

5 a valve member having a valve passage aligned with the primary valve passage and through which vapors pass when the valve assembly is in the first position; and

a valve body having a bore in which the valve member is seated for reciprocal movement to and between the first and second positions.

4. The assembly of claim 3 wherein the stop is mounted on a distal end of the valve member and the diaphragm is mounted on a proximal end of the valve member.

5. The assembly of claim 1 further comprising:
a spring located in the chamber and coupled to the diaphragm,
the spring biasing the diaphragm and valve assembly toward the first
position.
6. The assembly of claim 1 wherein the secondary vapor passage is
connected to the primary vapor passage upstream from the valve
assembly.
7. The assembly of claim 1 wherein the stop and the diaphragm are
coupled to opposite ends of the valve assembly.

8. An assembly for use in a fueling system in which fuel from a storage tank is pumped through a hose to a nozzle for discharge into a fuel tank of a vehicle, the fueling system including a vapor recovery system to process fuel vapors displaced from the fuel tank during fueling, the assembly comprising:

a primary vapor passage adapted to be in fluid communication with the vapor recovery system;

a valve member moveable within a bore of a valve body between first and second positions, the first position permitting the uninterrupted flow of vapors through the primary vapor passage and the second position inhibiting the flow of vapors through the primary vapor passage, the valve member having a valve passage aligned with the primary valve passage and through which vapors pass when the valve assembly is in the first position;

a diaphragm mounted within a chamber and coupled to the valve member;

a spring located in the chamber and coupled to the diaphragm, the spring biasing the diaphragm and valve member toward the first position;

a housing holding the valve assembly and the diaphragm and defining at least in part the chamber;

a secondary vapor passage in fluid communication with the chamber and the primary vapor passage upstream from the valve assembly;

25 an air bleed passage in fluid communication at a first end with the
primary vapor passage upstream from the valve assembly; and
a stop coupled to the valve assembly and moveable between
open and closed positions, the stop in the closed position sealing a
second end of the air bleed passage when the valve assembly is in the
30 first position, the stop in the open position opening the second end to
ambient atmosphere when the valve assembly is in the second position;
wherein when the air pressure in the chamber is reduced to a
predetermined level the diaphragm and the valve assembly coupled
thereto move from the first position to the second position and thereby
35 inhibit flow in the valve assembly through the primary vapor passage and
vent the primary vapor passage through the air bleed passage when the
stop moves to the open position.

9. The assembly of claim 8 wherein the stop is mounted on a distal
end of the valve member and the diaphragm is mounted on a proximal
end of the valve member.

10. A fueling system comprising:

a storage tank for storing fuel;

a hose for transferring the fuel from the storage tank;

a pump operably coupled to the hose for pumping the fuel

5 through the hose;

a nozzle connected to the hose for dispensing the fuel into a fuel tank of a vehicle;

a vapor recovery system for processing vapors displaced from the fuel tank, the vapor recovery system including a pump for pumping the vapors from the fuel tank and a primary vapor passage in the hose through which the vapors are removed from the fuel tank;

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the vapor recovery system further comprising

(a) a valve assembly moveable between first and second positions, the first position permitting the uninterrupted flow of vapors through the primary vapor passage and the second position inhibiting the flow of vapors through the primary vapor passage, the valve assembly being biased toward the first position;

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(b) a diaphragm mounted within a chamber and coupled to the valve assembly;

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(c) a secondary vapor passage in fluid communication with the chamber and the primary vapor passage;

(d) an air bleed passage in fluid communication at a first end with the primary vapor passage upstream from the valve assembly;

(e) a stop coupled to the valve assembly and moveable
25 between open and closed positions, the stop in the closed position
sealing a second end of the air bleed passage when the valve assembly
is in the first position, the stop in the open position opening the second
end to ambient atmosphere when the valve assembly is in the second
position;

30 wherein when the air pressure in the chamber is reduced to a
predetermined level the diaphragm and the valve assembly coupled
thereto move from the first position to the second position and thereby
inhibit flow in the valve assembly through the primary vapor passage and
vent the primary vapor passage through the air bleed passage when the
35 stop moves to the open position.

11. The system of claim 10 further comprising:

a housing holding the valve assembly and the diaphragm and
defining at least in part the chamber.

12. The system of claim 10 wherein the valve assembly further
comprises:

a valve member having a valve passage aligned with the primary
valve passage and through which vapors pass when the valve assembly
5 is in the first position; and

a valve body having a bore in which the valve member is seated
for reciprocal movement to and between the first and second positions.

13. The system of claim 3 wherein the stop is mounted on a distal end of the valve member and the diaphragm is mounted on a proximal end of the valve member.

14. The system of claim 10 further comprising:
a spring located in the chamber and coupled to the diaphragm, the spring biasing the diaphragm and valve assembly toward the first position.

15. The system of claim 10 wherein the secondary vapor passage is connected to the primary vapor passage upstream from the valve assembly.

16. The system of claim 10 wherein the stop and the diaphragm are coupled to opposite ends of the valve assembly.

17. The system of claim 10 wherein the valve assembly is incorporated into the nozzle.

18. A fueling system comprising:

a storage tank for storing fuel;

a hose for transferring the fuel from the storage tank;

a pump operably coupled to the hose for pumping the fuel

5 through the hose;

a nozzle connected to the hose for dispensing the fuel into a fuel tank of a vehicle;

a vapor recovery system for processing vapors displaced from the fuel tank, the vapor recovery system including a pump for pumping the vapors from the fuel tank and a primary vapor passage in the hose through which the vapors are removed from the fuel tank;

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the vapor recovery system further comprising

(a) a valve member moveable within a bore of a valve body between first and second positions, the first position permitting the uninterrupted flow of vapors through the primary vapor passage and the second position inhibiting the flow of vapors through the primary vapor passage, the valve member having a valve passage aligned with the primary valve passage and through which vapors pass when the valve assembly is in the first position;

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(b) a diaphragm mounted within a chamber and coupled to the valve member;

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(c) a spring located in the chamber and coupled to the diaphragm, the spring biasing the diaphragm and valve member toward the first position;

- 25 (d) a housing holding the valve assembly and the diaphragm and defining at least in part the chamber;
- (e) a secondary vapor passage in fluid communication with the chamber and the primary vapor passage upstream from the valve assembly;
- 30 (f) an air bleed passage in fluid communication at a first end with the primary vapor passage upstream from the valve assembly; and
- (g) a stop coupled to the valve assembly and moveable between open and closed positions, the stop in the closed position
- 35 sealing a second end of the air bleed passage when the valve assembly is in the first position, the stop in the open position opening the second end to ambient atmosphere when the valve assembly is in the second position;
- wherein when the air pressure in the chamber is reduced to a
- 40 predetermined level the diaphragm and the valve assembly coupled thereto move from the first position to the second position and thereby inhibit flow in the valve assembly through the primary vapor passage and vent the primary vapor passage through the air bleed passage when the stop moves to the open position.

19. The system of claim 18 wherein the stop is mounted on a distal end of the valve member and the diaphragm is mounted on a proximal end of the valve member.

20. The system of claim 18 wherein the valve assembly is incorporated into the nozzle.